IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Applicants: Bednorz et al.

Serial No.: 08/479,810

Filed: June 7, 1995

Date: May 15, 2008

Docket: YO987-074BZ

Group Art Unit: 1751

Examiner: M. Kopec

For: NEW SUPERCONDUCTIVE COMPOUNDS HAVING HIGH TRANSITION TEMPERATURE, METHODS FOR THEIR USE AND PREPARATION

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

CORRECTED APPEAL BRIEF

Part VII

CFR 37 §41.37(c)(1)(vii)

VOLUME 3

Part 1

Preliminary Comments and

Argument For the Patentability of Each Rejected Claims 1-149

Respectfully submitted,

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PRELIMINARY COMMENTS A

All the claims are individually appealed.

PRELIMINARY COMMENTS B

Each rejected claim is appealed individually. In this part arguments are provided, for each claim individually, for why each claim is enabled in view of Applicants' teaching. Applicants do not rely on these enablement statements to provide a teaching that is missing from Applicants' teaching, but they corroborate the truth of Applicants' teaching and are therefore evidence that Applicants' claims are fully enabled by Applicants' teaching. For convenience in the comments Applicants will use the following shorthand notation which are defined below:

- Examiner's First Enablement Statement
- Examiner's Second Enablement Statement
- Examiner's Third Enablement Statement
- Examiner's Fourth Enablement Statement
- Poole 1988 Enablement Statement
- Poole 1995 Enablement Statement
- Poole 1996 Enablement Statement
- Schuller Enablement Statement
- Rao enablement Statement

EXAMINER'S FIRST ENABLEMENT STATEMENT

At page 8 of the Final Action the Examiner states (this is referred to herein as the Examiner's First Enablement Statement):

The Examiner does not deny that the instant application includes "all know principles of ceramic science", or that once a person of skill in the art knows of a specific type of composition which is superconducting at greater than or equal to 26K, such a person of skill in the art, using the techniques described in the application, which included all principles of ceramic fabrication known at the time the application was initially filed, can make the known superconductive

compositions. The numerous 1.132 declarations, such as those of Mitzi, Shaw, Dinger and Duncombee, and the Rao article, are directed to production of know superconductive materials. (Emphasis in the original)

Thus the Examiner agrees that "a person of skill in the art, using the techniques described in the application, which included all principles of ceramic fabrication known at the time the application was initially filed, can make the known superconductive compositions." The principals of ceramic science taught by Applicants to fabricate high Tc Superconductors were known long before Applicants' discovery.

EXAMINER'S SECOND ENABLEMENT STATEMENT

The Examiner has essentially said this by rejecting Applicants' non-allowed claims as anticipated under §102(a) or obvious under §103(a) in view of the Asahi Shinbum article (Brief Attachment AV) at page 16 of the Office Action dated 07/30/1998. In regards to the rejection of claims 1, 13-31, 33-38, 40-46, 55-59, 64, 67-72, 77-81, 84-86, 91-96, 103, 109, 111-116, 119, 120 and 124 under 35 USC 103(a) over the Asahi Shinbum article the Examiner states at page 17 of the Office Action dated 07/30/1998 "based on the teachings of the Asahi Shinbum article as a whole, it would have been obvious to one of such skill because that reference teaches superconductivity in an oxide compound of La and Cu with Ba having a structure of the so-called perovskite structure". In the Office Action of 07/30/1998 claim 123 was allowed over the Asahi Shinbum article because it showed criticality for the formula recited in this claim.

The English translation of the Ashai Shinbum Article is page 2 of Brief Attachment AV.

The Asahi Shinbum article states in the first paragraph:

A new ceramic with a very high Tc of 30K of the superconducting transition has been found. The possibility of high Tc - superconductivity has been reported by scientists in Switzerland this spring. The group of Prof. Shoji TANAKA, Dept.

Appl. Phys. Faculty of Engineering at the University of Tokyo confirmed in November, that this is true.

and in the second paragraph:

The ceramic newly discovered, is an oxide compound of La and Cu with Barium which has a structure of the so-called perovskite and shows metal-like properties. Prof. Tanaka's laboratory confirmed that this material shows diamagnitism (Meisner effect) which is the most important indication of the existence of superconductivity.

The Swiss scientist are the inventors (Applicants) of the present application. Thus this clearly refers to Applicants' work which was reported in Applicants' article (Brief Attachment AX) which is incorporated by reference in the present application. These passages say that Prof. Tanaka confirmed Applicants' work. The newly discovered ceramic referred to in the article is the ceramic reported on in Applicants' article. **It is thus clear that for the Examiner to have rejected Applicants' claim over the Asahi Shinbum article under 35 USC 103, the Examiner necessarily had to find that Applicants' article fully enabled their claims.** (This is the Examiner's Second Enablement Statement) The 35 USC 103 rejection over the Asahi Shinbum article was overcome by Applicants swearing behind the date of the Ashai Shinbum article.

EXAMINER'S THIRD ENABLEMENT STATEMENT

In the 07/053,307 ancestral application, in Office Action dated 04/20/91 (Brief Attachment AR) composition claims 1, 2, 5 through 11 inclusive, 40 through 44 inclusive, 46, 48, 51 through 54 inclusive, 60, 62, and 66 were finally rejected under 35 U.S.C. 102(b) or in the alternative under 35 U.S.C. 103 as unpatentable over seven prior art references. Applicants rebutted the Examiner's reasons for rejection based on limitations in the claims directed to Applicants' new discovery of the superconductive properties of these materials. In the 07/053,307 ancestral application final Office Action the Examiner asserted that the cited

references appeared to disclose materials, which inherently provided superconductive properties and consequently therefore, rendered the composition claims unpatentable. Since a rejection of the composition of matter claims reciting the high Tc property based on inherency necessarily requires that the recited alleged inherent claimed high Tc property is a necessary consequence of the prior art description of compositions of matter, the rejection for inherency necessarily requires that a person of skill in the art be able to make the compositions of matter described in the prior art which necessarily means that it was and is the Examiner's position that a person of skill in the art is enabled to make high Tc compositions of matter. **This is the Examiner's Third Enablement Statement.** Applicants claims under appeal are directed to an apparatus, device, structure, etc. using high Tc compositions of matter and based on the Examiner's Third Enablement Statement these claims are enabled.

EXAMINER'S FOURTH ENABLEMENT STATEMENT

At page 59 of the Brief submitted on 11/27/2006 Applicants note that the Examiner states at page 6 of Office Action dated 07/28/2004:

> Small changes in composition can result in dramatic changes in or loss of superconducting properties.

The Examiner cites no authority for why this statement is relevant to whether Applicants' claims are enabled. Arts that are usually considered predictable within the meaning of the US patent law are the mechanical and electrical arts. A mechanical apparatus is made up of gears, wheels, lever arms, etc. A small change in the size of one of these elements of a mechanical apparatus can result in the apparatus not functioning. An electrical apparatus is made up of resistors, capacitors, inductors, etc. A small change in the magnitude of one of these elements of an electrical apparatus can result in the apparatus not functioning. Thus that small changes in the value or magnitude of constituent elements of an invention can result in that apparatus not working is not prima facie evidence of lack of enablement as the Examiner's statement from page 6 of Office Action

dated 07/28/2004 suggests. In actual fact, the Examiner's comment implies enablement. By stating that "[s]mall changes in composition can result in dramatic changes in or loss of superconducting properties" the Examiner is, in fact, acknowledging that the compositions can be made and tested to determine whether the composition has the desired superconducting property. This is all that enablement requires. Thus the Examiner's statement quoted above supports the enablement of Applicants' claims. As stated in the Brief, to satisfy the enablement requirement, an Applicant does not have to foresee all species that come within the scope of Applicants' claims.

The Examiner's statement that "[s]mall changes in composition can result in dramatic changes in or loss of superconducting properties" is an Examiner's Fourth Enablement Statement.

POOLE 1988 ENABLEMENT STATEMENT

The chemistry involved in the process of making high Tc superconductor compositions does not have to be understood to fabricate samples as stated in the book "Copper Oxide Superconductors" by Charles P. Poole, et al. 1988 (See 48 of DST AFFIDAVITS (Brief Attachment AM, AN and AO and Brief Attachment AW) which states at page 59:

[c]opper oxide superconductors with a purity sufficient to exhibit zero resistivity or to demonstrate levitation (Early) are not difficult to synthesize. We believe that this is at least partially responsible for the explosive worldwide growth in these materials.

Poole further states at page 61:

[i]n this section three methods of preparation will be described, namely, the solid state, the coprecipitation, and the sol-gel techniques (Hatfi). The widely used solid-state technique permits off-the-shelf chemicals to be directly calcined into superconductors, and it requires little familiarity with the subtle physicochemical process involved in the transformation of a mixture of compounds into a superconductor.

Since skilled artisans can fabricate samples without knowing the chemistry and without a detailed theory thus this art is predictable. All that is needed is routine experimentation to fabricate samples. There is no evidence to the contrary. The Examiner has cited no evidence to the contrary and has presented no argument to the contrary. **This is the Poole 1988 Enablement Statement.**

POOLE 1995 ENABLEMENT STATEMENT

Charles Poole et al. published another book in 1995 entitled Superconductivity" Academic Press which has a Chapter 7 on "Perovskite and Cuprate Crystallographic Structures". (Brief Attachment Z). This book will be referred to as Poole 1995.

At page 179 of Poole 1995 states:

V. PEROVSKITE-TYPE SUPERCONDUCTING STRUCTURES
In their first report on high-temperature superconductors Bednorz and Muller (1986) referred to their samples as "metallic, oxygen-deficient ... perovskite-like mixed-valence copper compounds." Subsequent work has confirmed that the new superconductors do indeed possess these characteristics.

Applicants claim 517 and 537 explicitly recite these types of limitations.

Thus Poole 1988 states that the high Tc superconducting materials "are not difficult to synthesize" and Poole 1995 states that "the new superconductors do indeed possess [the] characteristics" that Applicants' specification describes these new superconductors to have.
This is the Poole 1995 Enablement Statement.

POOLE 1996 ENABLEMENT STATEMENT

Paragraph 48 of each DST AFFIDAVIT (Brief Attachments AM, AN and AO) note that the book "The New Superconductors", by Frank J. Owens and Charles P. Poole, Plenum Press, 1996, referred to herein as Poole 1996 in Chapter 8 entitled "New High Temperature Superconductors" starting a page 97 (See Brief

Attachment AG) shows in Section 8.3 starting at page 98 entitled "Layered Structure of the Cuprates" schematic diagrams of the layered structure of the cuprate superconductors. Poole 1996 states in the first sentence of Section 8.3 at page 98 "All cuprate superconductors have the layered structure shown in Fig. 8.1." This is consistent with the teaching of Bednorz and Mueller that "These compositions have a layer-type Crystalline Structure often Perovskite-like" as noted in paragraph 14 of each of the DST AFFIDAVITS (above). Poole 1996 further states in the first sentence of Section 8.3 at page 98 "The flow of supercurrent takes place in conduction layers and bonding layers support and hold together the conduction layers". The caption of Fig. 8.1 states "Layering scheme of the cuprate superconductors". Fig. 8.3 shows details of the conduction layers for difference sequence of copper oxide planes and Fig. 8.4 presents details of the bonding layers for several of the cuprates which include binding layers for lanthanum superconductor La2CuO4, neodymium superconductor Nd2CuO4, yttrium superconductor YBa2Cu3O2n+4, bismuth superconductor Bi2Sr2Can-1 CunO2n+4, thallium superconductor Tl2Ba2Can-1CunO2n+4, and mercury superconductor HgBa2Can-1CunO2n+2. Fig. 8.5 at pages 102 and 103 show a schematic atomic structure showing the layering scheme for thallium superconductors. Fig. 8.10 at page 109 shows a schematic crystal structure showing the layering scheme for La2CuO4. Fig. 8.11 at page 110 shows a schematic crystal structure showing the layering scheme for HgBa2Ca2Cu3O8+x. Paragraph 48 of each DST AFFIDAVIT states that “[t]he layering shown in Poole 1996 for high Tc superconductors is consistent with the layering as taught by Bednorz and Mueller in their patent application.” **This is the Poole 1996 Enablement Statement.**

SCHULLER ENABLEMENT STATEMENT

Page 4 of the Final Rejection which cites Schuller et al "A Snapshot View of High Temperature Superconductivity 2002" (report from workshop on High Temperature Superconductivity held April 5-8, 2002 in San Diego) which the Examiner states "discusses both the practical applications and theoretical

mechanisms relating to superconductivity" and that “empirical searches in the oxides gave rise to many superconducting systems”

Schuller is acknowledging that experimental researchers using intuition and systematic searches found the other known high Tc superconductors. Systematic searching is applying what is known to the experimental solid state scientist, that is, knowledge of how to fabricate compounds of the same class as the compounds in which Bednorz and Muller first discovered High Tc superconductivity.

Schuller states "Of course, 'enlightened' empirical searches either guided by chemical and materials intuition or systematic searches using well-defined strategies may prove to be fruitful. It is interesting to note that while empirical searches in the oxides gave rise to many superconducting systems, similar (probable?) searches after the discovery of superconductivity in MgB2 have not uncovered any new superconductors." Schuller is acknowledging that experimental researchers using intuition and systematic searches found the other known high Tc superconductors. Systematic searching is applying what is known to the experimental solid state scientist, that is, knowledge of how to fabricate compounds of the same class as the compounds in which Bednorz and Muller first discovered High Tc superconductivity. In addition Applicants' specification explicitly teaches that High Tc materials can include Mg. Mg is an alkaline earth element. See for example. Clain 2 and the support in the specification identified in Brief Volume 2 for Claim 2. The combination of Mg and O is claimed for example in claim 428. **This is the Schuller Enablement Statement.**

RAO ENABLEMENT STATEMENT

The article of Rao et al. (Brief Attachment AB) states at page1, first paragraph of left column:

Several methods of synthesis have been employed for preparing cuprates, with the objective of obtaining pure monophasic products with good superconducting characteristics [3, 4]. The most common method of synthesis of cuprate superconductors is the traditional ceramic method which has been employed for the preparation of a large variety of oxide materials [5]. Although the ceramic method has yielded many of the cuprates with satisfactory characteristics, different synthetic strategies have become necessary in order to control factors such as the cation composition, oxygen stoichiometry, cation oxidation states and carrier concentration. Specifically noteworthy amongst these methods are chemical or solution routes which permit better mixing of the constituent cations in order to reduce the diffusion distance in the solid state [5, 6]. Such methods include coprecipitation, use of precursors, the sol-gel method and the use of alkali fluxes. The combustion method or self-propagating high-temperature synthesis (SHS) has also been employed.

Reference 5 of the Rao et al., article is another example of a reference to the general principles of ceramic science incorporated into Applicants' teaching. The Rao et al. article states that the 29 materials reported on in the article and listed in Table 1 thereof are fabricated using the general principles of ceramic science. Moreover, the Rao article states that these materials are fabricated by what the Rao article calls the "ceramic method" which is the preferred embodiment in Applicants' specification, yet 12 of the 29 materials in Table 1 do not come within the scope of the claims allowed by the Examiner. Thus known examples fabricated according to Applicants' teaching will not literally come within the scope of the claims so far allowed to Applicants. All 29 materials of Table 1 are fabricated through experimentation, i.e., without undue experimentation as shown in the affidavits in Brief Attachments AH, AI, AJ, AK, AL, AM, AN and AO and Poole 1988 (Brief Attachments AF and AW) Poole 1995 (Brief Attachment W) Poole 1996 (Brief Attachment AG) and the Rao article (Brief Attachment AB). **This is the Rao Enablement Statement.**

PRELIMINARY COMMENTS C

The quoted text of eache claim includes the correction of the typographical errors noted at page 240, of the first page of Section VIII, of Volume 1 of this Corrected Appeal Brief. This has been done so that each claim can be understood

PRELIMINARY COMMENTS D

The Examiner has provided no evidence or argument that a species that comes within the scope of any of Applicants' claims exists, or can be made, but cannot be made and determined to have the high Tc superconductive property following Applicants teaching, when viewed from the point of view of a person or ordinary skill in the art as of Applicants earliest priority date. The Examiner has provided no reason to doubt that a person of skill in the art as of Applicants earliest priority date can not practice ny of Applicants' claims rejected as not enabled. Thus the Examiner has not made out a prima facie case of lack of enablement. In view thereof Applicants request the Board to reverse the rejections of Applicants' claims for lack of enablement.

ARGUMENTS FOR THE PATENTABILITY OF EACH CLAIM INDIVIDUALLY

CLAIM 1

Claim 1 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombee, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 2

Claim 2 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 2 The superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of said rare earth or rare earth-like element in said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 3

Claim 3 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 2 The superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of said rare earth or rare earth-like element in said composition.
>
> CLAIM 3 The superconducting apparatus of claim 2, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 4

Claim 4 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 2 The superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of said rare earth or rare earth-like element in said composition.
>
> CLAIM 3 The superconducting apparatus of claim 2, where said transition metal is Cu.
>
> CLAIM 4 The superconducting apparatus of claim 3, where said alkaline earth element is selected from the group consisting of B, Ca, Ba, and Sr.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner

has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 5

Claim 5 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 5 The superconducting apparatus of claim 1, where said transition metal element is selected from the group consisting of Cu, Ni, and Cr.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 6

Claim 6 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 2 The superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of said rare earth or rare earth-like element in said composition.
>
> CLAIM 6 The superconducting apparatus of claim 2, where said rare earth or rare earth-like element is selected from the group consisting of La, Nd, and Ce.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 7

Claim 7 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 7 The superconducting apparatus of claim 1, where said phase is crystalline with a perovskite-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 8

Claim 8 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 2 The superconducting apparatus of claim 1, further including an alkaline earth element substituted for at least one atom of said rare earth or rare earth-like element in said composition.
>
> CLAIM 8 The superconducting apparatus of claim 2, where said phase is crystalline with a perovskite-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 9

Claim 9 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 9 The superconducting apparatus of claim 1, where said phase exhibits a layer-like crystalline structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 10

Claim 10 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 10 The superconducting apparatus of claim 1, where said phase is a mixed copper oxide phase.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 11

Claim 11 recites:

> CLAIM 1 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or rare earth-like element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, a means for maintaining said composition at said temperature to exhibit said superconductivity and a current source for passing an electrical superconducting current through said composition while exhibiting said superconductivity.
>
> CLAIM 11 The superconducting apparatus of claim 1, where said composition is comprised of mixed oxides with alkaline earth doping.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 12

Claim 12 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

Applicant notes that the Schuller Enablement Statement specifically states that systematic study in the oxides give rise to many high Tc systems. A systematic study is what a person of ordinary skill in the art knows how to do.

CLAIM 13

Claim 13 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 13 The combination of claim 12, where said superconductive composition includes a transition metal oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 14

Claim 14 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 14 The combination of claim 12, where said superconductive composition includes Cu-oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 15

Claim 15 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 16

Claim 16 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.
>
> CLAIM 16 The combination of claim 15, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 17

Claim 17 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.
>
> CLAIM 17 The combination of claim 15, where said additional element is a rare earth or rare earth-like element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 18

Claim 18 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.
>
> CLAIM 18 The combination of claim 15, where said additional element is an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 19

Claim 19 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 19 The combination of claim 12, where said composition includes a perovskite-like superconducting phase.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 20

Claim 20 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 20 The combination of claim 12, where said composition includes a substituted transition metal oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 21

Claim 21 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 20 The combination of claim 12, where said composition includes a substituted transition metal oxide.
>
> CLAIM 21 The combination of claim 20, where said substituted transition metal oxide includes a multivalent transition metal element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 22

Claim 22 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 20 The combination of claim 12, where said composition includes a substituted transition metal oxide.
>
> CLAIM 22 The combination of claim 20, where said substituted transition metal oxide is an oxide of copper.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 23

Claim 23 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 20 The combination of claim 12, where said composition includes a substituted transition metal oxide.
>
> CLAIM 23 The combination of claim 20, where said substituted transition metal oxide has a layer-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 24

Claim 24 recites:

> CLAIM 24 An apparatus comprising:
>
> a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to of 26°K,
>
> means for lowering the temperature of said material at least to said critical temperature to produce said superconducting state in said phase, and
>
> means for passing an electrical superconducting current through said transition metal oxide while it is in said superconducting state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 25

Claim 25 recites:

> CLAIM 24 An apparatus comprising:
>
> a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to of 26°K,
>
> means for lowering the temperature of said material at least to said critical temperature to produce said superconducting state in said phase, and
>
> means for passing an electrical superconducting current through said transition metal oxide while it is in said superconducting state.
>
> CLAIM 25 The apparatus of claim 24, where said transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 26

Claim 26 recites:

> CLAIM 24 An apparatus comprising:
>
> a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to of 26°K,
>
> means for lowering the temperature of said material at least to said critical temperature to produce said superconducting state in said phase, and
>
> means for passing an electrical superconducting current through said transition metal oxide while it is in said superconducting state.
>
> CLAIM 26 The apparatus of claim 24, where said transition metal oxide is comprised of a Cu oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 27

Claim 27 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 28

Claim 28 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.
>
> CLAIM 28 The superconducting apparatus of claim 27, where said substituted Cu-oxide includes a rare earth or rare earth-like element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 29

Claim 29 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.
>
> CLAIM 29 The superconducting apparatus of claim 27, where said substituted Cu-oxide includes an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 30

Claim 30 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.
>
> CLAIM 29 The superconducting apparatus of claim 27, where said substituted Cu-oxide includes an alkaline earth element.
>
> CLAIM 30 The superconducting apparatus of claim 29, where said alkaline earth element is atomically large with respect to Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 31

Claim 31 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.
>
> CLAIM 31 The superconducting apparatus of claim 27, where said composition has a crystalline structure which enhances electron-phonon interactions to produce superconductivity at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 32

Claim 32 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.
>
> CLAIM 31 The superconducting apparatus of claim 27, where said composition has a crystalline structure which enhances electron-phonon interactions to produce superconductivity at a temperature greater than or equal to 26°K.
>
> CLAIM 32 The superconducting apparatus of claim 31, where said crystalline structure is layer-like, enhancing the number of Jahn-Teller polarons in said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on

Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 33

Claim 33 recites:

> CLAIM 33 A superconducting apparatus comprising a composition having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a copper oxide doped with an alkaline earth element where the concentration of said alkaline earth element is near to the concentration of said alkaline earth element where the superconducting copper oxide phase in said composition undergoes an orthorhombic to tetragonal structural phase transition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 34

Claim 34 recites:

> CLAIM 34 A superconducting apparatus having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a mixed copper oxide doped with an element chosen to result in Cu3+ ions in said composition and a current source for passing a superconducting current through said superconducting composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 35

Claim 35 recites:

> CLAIM 34 A superconducting apparatus having a superconducting onset temperature greater than or equal to 26°K, the composition being comprised of a mixed copper oxide doped with an element chosen to result in Cu3+ ions in said composition and a current source for passing a superconducting current through said superconducting composition.
>
> CLAIM 35 The superconducting apparatus of claim 34, where said doping element includes an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 36

Claim 36 recites:

> CLAIM 36 A combination comprising:
>
> a composition having a superconducting onset temperature greater than or equal to 26°K, said composition being comprised of a substituted copper oxide exhibiting mixed valence states and at least one other element in its crystalline structure,
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and
>
> cooling means for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 37

Claim 37 recites:

> CLAIM 36 A combination comprising:
>
> a composition having a superconducting onset temperature greater than or equal to 26°K, said composition being comprised of a substituted copper oxide exhibiting mixed valence states and at least one other element in its crystalline structure,
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and
>
> cooling means for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 37 The combination of claim 36, where said at least one other element is an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 38

Claim 38 recites:

> CLAIM 36 A combination comprising:
>
> a composition having a superconducting onset temperature greater than or equal to 26°K, said composition being comprised of a substituted copper oxide exhibiting mixed valence states and at least one other element in its crystalline structure,
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and
>
> cooling means for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 38 The combination of claim 36, where said at least one other element is an element which results in Cu3+ ions in said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 39

Claim 39 recites:

> CLAIM 36 A combination comprising:
>
> a composition having a superconducting onset temperature greater than or equal to 26°K, said composition being comprised of a substituted copper oxide exhibiting mixed valence states and at least one other element in its crystalline structure,
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and
>
> cooling means for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 39 The combination of claim 36, where said at least one other element is an element chosen to result in the presence of both Cu2+ and Cu3+ ions in said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 40

Claim 40 recites:

> CLAIM 40 An apparatus comprising a superconductor exhibiting a superconducting onset at an onset temperature greater than or equal to 26°K, said superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K, means for maintaining said superconductor at an operating temperature in excess of said onset temperature to maintain said superconductor in a superconducting state and means for passing current through said superconductor while in said superconducting state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 41

Claim 41 recites:

> CLAIM 40 An apparatus comprising a superconductor exhibiting a superconducting onset at an onset temperature greater than or equal to 26°K, said superconductor being comprised of at least four elements, none of which is itself superconducting at a temperature greater than or equal to 26°K, means for maintaining said superconductor at an operating temperature in excess of said onset temperature to maintain said superconductor in a superconducting state and means for passing current through said superconductor while in said superconducting state.
>
> CLAIM 41 The apparatus of claim 40, where said elements include a transition metal and oxygen.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 42

Claim 42 recites:

> CLAIM 42 A apparatus having a superconducting onset temperature greater than or equal to 26°K, said superconductor being a doped transition metal oxide, where said transition metal is itself non-superconducting and a current source for passing a superconducting electric current through said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 43

Claim 43 recites:

> CLAIM 42 A apparatus having a superconducting onset temperature greater than or equal to 26°K, said superconductor being a doped transition metal oxide, where said transition metal is itself non-superconducting and a current source for passing a superconducting electric current through said composition.
>
> CLAIM 43 The apparatus of claim 42, where said doped transition metal oxide is multivalent in said superconductor.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 44

Claim 44 recites:

> CLAIM 42 A apparatus having a superconducting onset temperature greater than or equal to 26°K, said superconductor being a doped transition metal oxide, where said transition metal is itself non-superconducting and a current source for passing a superconducting electric current through said composition.
>
> CLAIM 44 The apparatus of claim 42, further including an element which creates a mixed valent state of said transition metal.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 45

Claim 45 recites:

> CLAIM 42 A apparatus having a superconducting onset temperature greater than or equal to 26°K, said superconductor being a doped transition metal oxide, where said transition metal is itself non-superconducting and a current source for passing a superconducting electric current through said composition.
>
> CLAIM 43 The apparatus of claim 42, where said doped transition metal oxide is multivalent in said superconductor.
>
> CLAIM 45 The apparatus of claim 43, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 46

Claim 46 recites:

> CLAIM 46 An apparatus having a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being an oxide having multivalent oxidation states and including a metal, said oxide having a crystalline structure which is oxygen deficient and means for passing a superconducting electric current through said superconductor.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 47

Claim 47 recites:

> CLAIM 46 An apparatus having a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being an oxide having multivalent oxidation states and including a metal, said oxide having a crystalline structure which is oxygen deficient and means for passing a superconducting electric current through said superconductor.
>
> CLAIM 47 The apparatus of claim 46, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 48

Claim 48 recites:

> CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 49

Claim 49 recites:

> CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.
>
> CLAIM 49 The superconductive apparatus of claim 48, where said transition metal oxide is multivalent in said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 50

Claim 50 recites:

> CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.
>
> CLAIM 50 The superconductive apparatus of claim 48, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 51

Claim 51 recites:

> CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.
>
> CLAIM 51 The superconductive apparatus of claim 48, where said substitutions include an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 52

Claim 52 recites:

> CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.
>
> CLAIM 52 The superconductive apparatus of claim 48, where said substitutions include a rare earth or rare earth-like element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 53

Claim 53 recites:

> CLAIM 53 A superconductive apparatus comprised of a copper oxide having a layer-like crystalline structure and at least one additional element substituted in said crystalline structure, said structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 54

Claim 54 recites:

> CLAIM 53 A superconductive apparatus comprised of a copper oxide having a layer-like crystalline structure and at least one additional element substituted in said crystalline structure, said structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K.
>
> CLAIM 54 The superconductor of claim 53, where said additional element creates a mixed valent state of said copper oxide in said superconductor.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 55

Claim 55 recites:

> CLAIM 55 A combination, comprising:
>
> a transition metal oxide having an superconducting onset temperature greater than about 26°K and having an oxygen deficiency, said transition metal being non-superconducting at said superconducting onset temperature and said oxide having multivalent states,
>
> a means for passing an electrical superconducting current through said oxide while said oxide is at a temperature greater than or equal to 26°K, and
>
> means for cooling said oxide in a superconducting state at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 56

CLAIM recites:

> CLAIM 55 A combination, comprising:
>
> a transition metal oxide having an superconducting onset temperature greater than about 26°K and having an oxygen deficiency, said transition metal being non-superconducting at said superconducting onset temperature and said oxide having multivalent states,
>
> a means for passing an electrical superconducting current through said oxide while said oxide is at a temperature greater than or equal to 26°K, and
>
> means for cooling said oxide in a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 56 The combination of claim 55, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 57

Claim 57 recites:

> CLAIM 57 A combination including;
>
> a superconducting oxide having a superconducting onset temperature greater than or equal to 26°K and containing at least 3 elements which are non-superconducting at said onset temperature,
>
> means for passing a superconducting current through said oxide while said oxide is maintained at a temperature greater than or equal to 26°K, and
>
> means for maintaining said oxide in a superconducting state at a temperature greater than or equal to 26°K and less than said superconductive onset temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 58

Claim 58 recites:

> CLAIM 58 A combination, comprised of:
>
> a copper oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in said oxide, said oxide being crystalline and having a layer-like structure,
>
> means for passing a superconducting current through said copper oxide while it is maintained at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and
>
> means for cooling said copper oxide to a superconductive state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 59

Claim 59 recites:

> CLAIM 59 A combination, comprised of:
>
> a ceramic-like material having an onset of superconductivity at an onset temperature greater than or equal to 26°K,
>
> means for passing a superconducting electrical current through said ceramic-like material while said material is maintained at a temperature greater than or equal to 26°K and less than said onset temperature, and
>
> means for cooling said superconducting ceramic-like material to a superconductive state at a temperature greater than or equal to 26°K and less than said onset temperature, said material being superconductive at temperatures below said onset temperature and a ceramic at temperatures above said onset temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 60

Claim 60 recites:

> CLAIM 60 An apparatus comprised of a transition metal oxide, and at least one additional element, said superconductor having a distorted crystalline structure characterized by an oxygen deficiency and exhibiting a superconducting onset temperature greater than or equal to of 26°K, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 61

Claim 61 recites:

> CLAIM 60 An apparatus comprised of a transition metal oxide, and at least one additional element, said superconductor having a distorted crystalline structure characterized by an oxygen deficiency and exhibiting a superconducting onset temperature greater than or equal to of 26°K, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature at a temperature greater than or equal to 26°K.
>
> CLAIM 61 The apparatus of claim 60, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 62

Claim 62 recites:

> CLAIM 62 An apparatus comprised of a transition metal oxide and at least one additional element, said superconductor having a distorted crystalline structure characterized by an oxygen excess and exhibiting a superconducting onset temperature greater than or equal to 26°K, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to of 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 63

Claim 63 recites:

> CLAIM 62 An apparatus comprised of a transition metal oxide and at least one additional element, said superconductor having a distorted crystalline structure characterized by an oxygen excess and exhibiting a superconducting onset temperature greater than or equal to 26°K, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to of 26°K.
>
> CLAIM 63 The apparatus of claim 62, where said transition metal is Cu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 64

Claim 64 recites:

> CLAIM 64 A combination, comprising:
>
> a mixed copper oxide composition having enhanced polaron formation, said composition including an element causing said copper to have a mixed valent state in said composition, said composition further having a distorted octahedral oxygen environment leading to a Tc greater than or equal to 26°K,
>
> means for providing a superconducting current through said composition at temperatures greater than or equal to 26°K and less than said Tc, and
>
> means for cooling said composition to a temperature greater than or equal to 26°K and less than said Tc.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 65

Claim 65 which is allowed recites:

> CLAIM 65 An apparatus comprising a composition exhibiting superconductivity at temperatures greater than or equal to 26°K, said composition being a ceramic-like material in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said composition, and O is oxygen, the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE : AE, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.

CLAIM 66

Claim 66 recites:

> CLAIM 66 An apparatus comprising a superconductive composition having a transition temperature greater than or equal to 26°K, the composition including a multivalent transition metal oxide and at least one additional element, said composition having a distorted orthorhombic crystalline structure, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 67

Claim 67 recites:

> CLAIM 66 An apparatus comprising a superconductive composition having a transition temperature greater than or equal to 26°K, the composition including a multivalent transition metal oxide and at least one additional element, said composition having a distorted orthorhombic crystalline structure, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.
>
> CLAIM 67 The apparatus of claim 66, where said transition metal oxide is a mixed copper oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 68

Claim 68 recites:

> CLAIM 66 An apparatus comprising a superconductive composition having a transition temperature greater than or equal to 26°K, the composition including a multivalent transition metal oxide and at least one additional element, said composition having a distorted orthorhombic crystalline structure, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.
>
> CLAIM 67 The apparatus of claim 66, where said transition metal oxide is a mixed copper oxide.
>
> CLAIM 68 The apparatus of claim 67, where said one additional element is an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 69

Claim 69 recites:

> CLAIM 69 A superconductive combination, comprising:
>
> a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 70

Claim 70 recites:

> CLAIM 69 A superconductive combination, comprising:
>
> a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.
>
> CLAIM 70 The combination of claim 69, where said transition metal oxide is a mixed copper oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 71

Claim 71 recites:

> CLAIM 69 A superconductive combination, comprising:
>
> a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.
>
> CLAIM 70 The combination of claim 69, where said transition metal oxide is a mixed copper oxide.
>
> CLAIM 71 The combination of claim 70, where said mixed copper oxide includes an alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 72

Claim 72 recites:

> CLAIM 69 A superconductive combination, comprising:
>
> a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.
>
> CLAIM 70 The combination of claim 69, where said transition metal oxide is a mixed copper oxide.
>
> CLAIM 71 The combination of claim 70, where said mixed copper oxide includes an alkaline earth element.
>
> CLAIM 72 The combination of claim 71, where said mixed copper oxide further includes a rare earth or rare earth-like element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 73

Claim 73 is withdrawn:

CLAIM 74

CLAIM 74 is withdrawn

CLAIM 75

Claim 75 is withdrawn

CLAIM 76

CLAIM 76 is withdrawn

CLAIM 77

Claim 77 which is allowed recites:

> CLAIM 77 A combination, comprising:
>
> a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or rare earth-like element (RE), said composition having a layer-like crystalline structure and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K, and
>
> electrical means for passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 78

CLAIM 78 which is allowed recites:

CLAIM 78 The combination of claim 77, where the ratio (AE,RE) : Cu is substantially 1:1.

CLAIM 79

Claim 79 which is allowed recites:

CLAIM 79 The combination of claim 77, where the ratio (AE,RE) : Cu is substantially 1:1.

CLAIM 80

Claim 80 which is allowed recites:

CLAIM 80 The combination of claim 77, wherein said crystalline structure is perovskite-like.

CLAIM 81

CLAIM 81 which is allowed recites:

CLAIM 81 The combination of claim 77, where said mixed copper oxide composition has a non-stoichiometric amount of oxygen therein.

CLAIM 82

CLAIM 82 is withdrawn

CLAIM 83

CLAIM 83 is withdrawn

CLAIM 84

Claim 84 recites:

> CLAIM 84 A superconducting combination, comprising:
>
> a mixed transition metal oxide composition containing a non-stoichiometric amount of oxygen therein, a transition metal and at least one additional element, said composition having substantially zero resistance to the flow of electricity therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed transition metal oxide has a superconducting onset temperature greater than or equal to 26°K, and
>
> electrical means for passing an electrical superconducting current through said composition when said composition is in said superconducting state at a temperature greater than or equal to 26°K, and less than said superconducting onset temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 85

Claim 85 recites:

> CLAIM 84 A superconducting combination, comprising:
>
> a mixed transition metal oxide composition containing a non-stoichiometric amount of oxygen therein, a transition metal and at least one additional element, said composition having substantially zero resistance to the flow of electricity therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed transition metal oxide has a superconducting onset temperature greater than or equal to 26°K, and
>
> electrical means for passing an electrical superconducting current through said composition when said composition is in said superconducting state at a temperature greater than or equal to 26°K, and less than said superconducting onset temperature.
>
> CLAIM 85 The combination of claim 84, where said transition metal is copper.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 86

CLAIM 86 which is allowed recites:

> CLAIM 86 An apparatus comprising:
>
> a composition including a transition metal, a rare earth or rare earth-like element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting onset temperature greater than or equal to 26°K,
>
> a temperature controller for maintaining said composition to said superconducting state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and
>
> a current source for passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 87

Claim 87 which is allowed recites:

> CLAIM 87 The apparatus of claim 86, where said transition metal is copper.

CLAIM 88

Claim 88 recites:

> CLAIM 88 An apparatus comprising:
>
> a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,
>
> a cooler for cooling said composition to a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and
>
> a current source for passing an electrical current through said composition while said composition is in said superconductive state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 89

Claim 89 recites:

> CLAIM 88 An apparatus comprising:
>
> a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,
>
> a cooler for cooling said composition to a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and
>
> a current source for passing an electrical current through said composition while said composition is in said superconductive state.
>
> CLAIM 89 The apparatus of claim 88, where said composition is comprised of a metal oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 90

Claim 90 recites:

> CLAIM 88 An apparatus comprising:
>
> a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,
>
> a cooler for cooling said composition to a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and
>
> a current source for passing an electrical current through said composition while said composition is in said superconductive state.
>
> CLAIM 90 The apparatus of claim 88, where said composition is comprised of a transition metal oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 91

Claim 91 recites:

> CLAIM 91 A combination, comprising:
>
> a composition exhibiting the onset of a DC substantially zero resistance state at an onset temperature in excess of 30°K, and
>
> means for passing an electrical current through said composition while it is in said substantially zero resistance state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 92

Claim 92 recites:

> CLAIM 91 A combination, comprising:
>
> a composition exhibiting the onset of a DC substantially zero resistance state at an onset temperature in excess of 30°K, and
>
> means for passing an electrical current through said composition while it is in said substantially zero resistance state.
>
> CLAIM 92 The combination of claim 91, where said composition is a copper oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 93

CLAIM 93 recites:

> CLAIM 93 An apparatus, comprising:
>
> a mixed copper oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and
>
> a current source for producing an electrical current through said copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 94

Claim 94 recites:

> CLAIM 93 An apparatus, comprising:
>
> a mixed copper oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and
>
> a current source for producing an electrical current through said copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 94 The apparatus of claim 93, where said copper oxide material exhibits a layer-like crystalline structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 95

Claim 95 recites:

> CLAIM 93 An apparatus, comprising:
>
> a mixed copper oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and
>
> a current source for producing an electrical current through said copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 95 The apparatus of claim 93, where said copper oxide material exhibits a mixed valence state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 96

Claim 96 recites:

> CLAIM 96 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:
>
> (a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature Tc of greater than or equal to 26°K;
>
> (b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature Tc of the superconductive composition; and
>
> (c) means for causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 97

Claim 97 which is allowed recites:

> CLAIM 96 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:
>
> (a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature Tc of greater than or equal to 26°K;
>
> (b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature Tc of the superconductive composition; and
>
> (c) means for causing an electric current to flow in the superconductor element.
>
> CLAIM 97 The superconductive apparatus according to claim 96 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or rare-earth-like element and at least one alkaline-earth element.

CLAIM 98

Claim 98 which is allowed recites:

> CLAIM 98 The superconductive apparatus according to claim 97 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 99

Claim 99 which is allowed recites:

> CLAIM 99 The superconductive apparatus according to claim 97 in which the alkaline-earth element is barium.

CLAIM 100

Claim 100 recites:

> CLAIM 100 The superconductive apparatus according to claim 96 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 101

Claim 101 recites:

> CLAIM 100 The superconductive apparatus according to claim 96 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.
>
> CLAIM 101 The superconductive apparatus according to claim 100 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 102

Claim 102 recites:

> CLAIM 100 The superconductive apparatus according to claim 96 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.
>
> CLAIM 101 The superconductive apparatus according to claim 100 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.
>
> CLAIM 102 The superconductive apparatus according to claim 101 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 103

Claim 103 which is allowed recites:

> CLAIM 103 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:
>
> (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature Tc and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature Tq=o, the transition-onset temperature Tc being greater than or equal to 26°K;
>
> (b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature Tq=o of the superconductive composition; and
>
> (c) a current source for causing an electric current to flow in the superconductor element.

CLAIM 104

Claim 104 which is allowed recites:

> CLAIM 104 The superconductive apparatus according to claim 103 in which the rare-earth or rare-earth-like element is lanthanum.

CLAIM 105

Claim 105 which is allowed recites:

> CLAIM 105 The superconductive apparatus according to claim 103 in which the alkaline-earth element is barium.

CLAIM 106

Claim 106 which is allowed recites:

> CLAIM 106 The superconductive apparatus according to claim 103 in which the copper-oxide compound of the superconductive composition includes mixed valent copper ions.

CLAIM 107

Claim 107 which is allowed recites:

> CLAIM 107 The superconductive apparatus according to claim 106 in which the copper-oxide compound includes at least one element in a nonstoichiometric atomic proportion.

CLAIM 108

Claim 108 which is allowed recites:

> CLAIM 108 The superconductive apparatus according to claim 107 in which oxygen is present in the copper-oxide compound in a nonstoichiometric atomic proportion.

CLAIM 109

Claim 109 recites:

> CLAIM 109 A superconductive apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or alkaline earth element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 110

Claim 110 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.
>
> CLAIM 110 The combination of claim 15, where said additional element is rare earth or alkaline earth element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 111

Claim 111 recites:

> CLAIM 111 A device comprising a superconducting transition metal oxide having a superconductive onset temperature greater than or equal to 26°K, said superconducting transition metal oxide being at a temperature less than said superconducting onset temperature and having a superconducting current flowing therein.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 112

Claim 112 recites:

> CLAIM 112 A device comprising a superconducting copper oxide having a superconductive onset temperature greater than or equal to 26°K, said superconducting copper oxide being at a temperature less than said superconducting onset temperature and having a superconducting current flowing therein.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 113

Claim 113 which is allowed recites:

> CLAIM 113 A device comprising a superconducting oxide composition having a superconductive onset temperature greater than or equal to 26°K, said superconducting copper oxide being at a temperature less than said superconducting onset temperature and having a superconducting current flowing therein, said composition comprising at least one each of rare earth, an alkaline earth, and copper.

CLAIM 114

Claim 114 which is allowed recites:

> CLAIM 114 A device comprising a superconducting oxide composition having a superconductive onset temperature greater than or equal to 26°K, said superconducting copper oxide being at a temperature less than said superconducting onset temperature and having a superconducting current flowing therein, said composition comprising at least one each of a group IIIB element, an alkaline earth, and copper.

CLAIM 115

Claim 115 recites:

> CLAIM 115 A device comprising a transition metal oxide having a Tc greater than or equal to 26°K carrying a superconducting current said transition metal oxide is maintained at a temperature less than said Tc.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 116

Claim 116 recites:

> CLAIM 116 An apparatus comprising a transition metal oxide having a Tc greater than or equal to 26°K carrying a superconducting current said transition metal oxide is maintained at a temperature less than said Tc.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 117

Claim 117 recites:

> CLAIM 117 A structure comprising a transition metal oxide having a Tc greater than or equal to 26°K carrying a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 118

Claim 118 recites:

> CLAIM 118 An apparatus comprising a transition metal oxide having a Tc greater than or equal to 26°K carrying a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 119

Claim 119 recites:

> CLAIM 119 A device comprising a copper oxide having a Tc greater than or equal to 26°K carrying a superconducting current said copper oxide is maintained at a temperature less than said Tc.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 120

Claim 120 recites:

> CLAIM 120 An apparatus comprising a copper oxide having a Tc greater than or equal to 26°K carrying a superconducting current said copper oxide is maintained at a temperature less than said Tc.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 121

Claim 121 recites:

> CLAIM 121 A device comprising a copper oxide having a Tc greater than or equal to 26°K carrying a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 122

Claim 122 recites:

> CLAIM 122 An apparatus comprising a copper oxide having a Tc greater than or equal to 26°K carrying a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 123

Claim 123 which is allowed recites:

> CLAIM 123 A superconductive apparatus comprising:
>
> a composition of the formula BaxLax-5Cu5OY wherein x is from about 0.75 to about 1 and y is the oxygen deficiency resulting from annealing said composition at temperatures from about 540oC to about 950oC and for times of about 15 minutes to about 12 hours, said composition having a metal oxide phase which exhibits a superconducting state at a critical temperature greater than or equal to 26°K;
>
> a temperature controller for maintaining the temperature of said composition at a temperature less than said critical temperature to induce said superconducting state in said metal oxide phase; and
>
> a current source for passing an electrical current through said composition while said metal oxide phase is in said superconducting state.

CLAIM 124

Claim 124 which is allowed recites:

> CLAIM 124 A device comprising a composition of matter having a Tc greater than or equal to 26°K carrying a superconducting current, said composition comprising at

least one each of a IIIB element, an alkaline earth, and copper oxide said device is maintained at a temperature less than said Tc.

CLAIM 125

Claim 125 which is allowed recites:

> CLAIM 125 An apparatus comprising a composition of matter having a Tc greater than or equal to 26°K carrying a superconducting current, said composition comprising at least one each of a rare earth, an alkaline earth, and copper oxide.

CLAIM 126

Claim 126 recites:

> CLAIM 126 A device comprising a composition of matter having a Tc greater than or equal to 26°K carrying a superconducting current, said composition comprising at least one each of a rare earth, and copper oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 127

Claim 127 recites:

> CLAIM 127 A device comprising a composition of matter having a Tc greater than or equal to 26°K carrying a superconducting current, said composition comprising at least one each of a IIIB element, and copper oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 128

Claim 128 recites:

> CLAIM 128 A transition metal oxide device comprising a Tc greater than or equal to 26°K and carrying a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 129

Claim 129 recites:

> CLAIM 129 A copper oxide device comprising a TC greater than or equal to 26°K and carrying a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 130

Claim 130 recites:

> CLAIM 130 A superconductive apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or Group III B element, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and a means for passing an electrical superconducting current through said composition which exhibiting said superconductivity.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 131

Claim 131 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.
>
> CLAIM 131 The combination of claim 15, where said additional element is a rare earth or Group III B element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 132

Claim 132 recites:

> CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,
>
> A current siurce for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and
>
> a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.
>
> CLAIM 132 The combination of claim 12, where said composition includes a substantially perovskite superconducting phase.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 133

Claim 133 recites:

> CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.
>
> CLAIM 133 The superconducting apparatus of claim 27, where said substituted Cu-oxide includes a rare earth or Group III B element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 134

Claim 134 recites:

> CLAIM 69 A superconductive combination, comprising:
>
> a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and
>
> means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.
>
> CLAIM 70 The combination of claim 69, where said transition metal oxide is a mixed copper oxide.
>
> CLAIM 71 The combination of claim 70, where said mixed copper oxide includes an alkaline earth element.
>
> CLAIM 134 The combination of claim 71, where said mixed copper oxide further includes a rare earth or Group III B element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 135

Claim 135 which is allowed recites:

> CLAIM 135 A combination, comprising:
>
> a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or Group III B element (RE), said composition having a substantially layered crystalline structure and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when in a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K and,

a current source for passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 136

Claim 136 which is allowed recites:

CLAIM 136 The combination of claim 77, where said crystalline structure is substantially perovskite.

CLAIM 137

Claim 137 which is allowed recites:

> CLAIM 137 An apparatus comprising:
>
> a composition including a transition metal, a rare earth or Group III B element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichimetric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,
>
> a temperature controller for maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and less than said superconducting onset temperature, and
>
> a current source for passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 138

Claim 138 which is allowed recites:

> CLAIM 138 The apparatus of claim 93, where said copper oxide material exhibits a substantially layered crystalline structure.

CLAIM 139

Claim 139 recites:

> CLAIM 139 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:
>
> (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the composition having a superconductor transition temperature Tc of greater than or equal to 26°K;
>
> (b) means for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature Tc of the superconductive composition; and
>
> (c) means for causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 140

Claim 140 which is allowed recites:

> CLAIM 140 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:
>
> (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a substantially layered perovskite crystal structure, the copper-oxide compound including at least one rare-earth or Group III B element and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature Tc and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature Tr=o, the transition-onset temperature Tc being greater than or equal to 26°K;
>
> (b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk- resistivity intercept temperature Tr=o of the superconductive composition; and
>
> (c) a current source for causing an electric current to flow in the superconductor element.

CLAIM 141

Claim 141 recites:

> CLAIM 141 An apparatus comprising a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,
>
> a temperature controller maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase, and
>
> a current source passing an electrical supercurrent through said transition metal oxide while it is in said superconducting state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 142

Claim 142 recites:

> CLAIM 141 An apparatus comprising a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,
>
> a temperature controller maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase, and
>
> a current source passing an electrical supercurrent through said transition metal oxide while it is in said superconducting state.
>
> CLAIM 142 The apparatus of claim 141, where said transition metal oxide is comprised of a transition metal capable of exhibiting multivalent states.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 143

Claim 143 recites:

> CLAIM 141 An apparatus comprising a transition metal oxide having a phase therein which exhibits a superconducting state at a critical temperature greater than or equal to 26°K,
>
> a temperature controller maintaining the temperature of said material at a temperature less than said critical temperature to produce said superconducting state in said phase, and
>
> a current source passing an electrical supercurrent through said transition metal oxide while it is in said superconducting state.
>
> CLAIM 143 The apparatus of claim 141, where said transition metal oxide is comprised of a Cu oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 144

Claim 144 which is allowed recites:

> CLAIM 144 An apparatus comprising:
>
> a composition including a transition metal, a rare earth or rare earth-like element, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,
>
> a temperature controller maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and
>
> a current source passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 145

Claim 145 which is allowed recites:

> CLAIM 145 The apparatus of claim 144, where said transition metal is copper.

CLAIM 146

Claim 146 recites:

> CLAIM 146 An apparatus:
>
> a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,
>
> a temperature controller maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and
>
> a current source passing an electrical current through said composition while said composition is in said superconductive state.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 147

Claim 147 recites:

> CLAIM 146 An apparatus:
>
> a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,
>
> a temperature controller maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and
>
> a current source passing an electrical current through said composition while said composition is in said superconductive state.
>
> CLAIM 147 The apparatus of claim 146, where said composition is comprised of a metal oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 148

Claim 148 recites:

> CLAIM 146 An apparatus:
>
> a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,
>
> a temperature controller maintaining said composition at a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and
>
> a current source passing an electrical current through said composition while said composition is in said superconductive state.
>
> CLAIM 148 The apparatus of claim 146, where said composition is comprised of a transition metal oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

CLAIM 149

Claim 149 recites:

> CLAIM 149 A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:
>
> (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound having a layer-type perovskite-like crystal structure, the composition having a superconductor transition temperature Tc of greater than or equal to 26°K;
>
> (b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature Tc of the superconductive composition; and
>
> (c) causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.